EXHIBIT A

Demodulation

February 25, 2002

1.0 Non-disclosure Agreement

COPY NUMBER _____

Demodulation LLC's business plan is confidential, containing information proprietary to Demodulation LLC. None of the information contained in this plan may be reproduced or disclosed to any person under any circumstances without express written permission of Demodulation LLC. I have accepted and will protect the confidentiality of this business plan.

_____

Recipients signature

_____

Date

Demodulation LLC
121 Goodwin Terrace
Westwood, NJ 07675
James O'Keefe, Jr.
201-666-0443

2.0 Executive Summary

2.1 Enterprise

Worldwide market conditions for new applications to enhance protection from forgery, brand abuse, counterfeiting, and theft have never been more favorable. Governments, industry, and consumers are stimulating this demand for quality security solutions. Demodulation LLC will provide many of the solutions to meet this overwhelming need.

The purpose behind the formation of Demodulation is to meld the necessary scientific and engineering capabilities with appropriate funding to allow validation and acquisition of breakthrough technology for the multi-billion dollar anti-theft/security markets. Demodulation would subsequently develop global product applications. The technology being considered has the potential to result in "intelligent" products, which are more efficacious and cost effective than existing products. In many cases, this technology will provide new applications to new markets, where none exist today. These unique products will replace those of the existing competition as well as create completely new opportunities.

This radical scientific advance is based on amorphous alloy fiber for applications in tamper-proof enclosures (medical packaging, for example), tamper-proof cartons (e.g. retail consumer products), traditional security printing (checks, passports, and bank notes), security/intelligent labels for computer recognition (inventory control through product identification), drivers license and credit cards (authentication). However, the biggest and most immediate opportunity is in the electronic article surveillance system (EAS) market that is estimated to be some $600 million worldwide. This market, which provides anti-theft protection for retail and industrial products, would be expanded dramatically. Demodulation's technology would offer government and commercial solutions not currently served by existing products.

One practical example of application relates to consumer theft. The large plastic anti-theft tags found on clothing in retail shops would be replaced by a hidden glass/alloy filament that has a diameter about one tenth that of human hair. This filament would be undetectable by the customer and will be encoded with stock-keeping information. Another example involves paper currency. This same filament may be incorporated into papers of various compositions and would have associated with it a unique electronic signature that prevents reproduction, counterfeiting, and forgery.

The technology to be acquired presently resides in an Israeli company that is under-funded and that lacks the skills to fully develop and commercialize it

worldwide. Based on the proper integration of marketing know-how in the United States, strategic focus, and appropriate capitalization with the skills of some of the most renowned glass, chemical, and metallurgical scientists in the world, Demodulation is projecting sales of over $300 MM in 2007.

Demodulation will combine the capabilities of world-class scientists and engineers from both the United States and Israel. Technical sales/marketing executives and businessmen who have significant experience in the anti-theft/security and related markets will drive this enterprise. The company would be located in New Jersey but would make extensive use of the Ceramic Corridor Incubator, located at Alfred University in upstate New York. Alfred is ranked as the top educational institution in the world of ceramics, glasses, and inorganic materials research and development. There are numerous opportunities for federal and state government funding for these advanced applications.

Demodulation estimates its capital needs at $20MM to authenticate and acquire this technology and to develop the appropriate products. This is a very conservative figure that would transition the company to profitability and positive cash flow in three years. Demodulation sales are projected to be $5MM in 2005 and $300 MM in 2007.

2.2 Personnel

Mr. Jim O'Keefe is Demodulation's founder, President and CEO. Mr. O'Keefe's expertise is in the area of business development and marketing of advanced technologies and has extensive international marketing and sales experience. Peter Cuneo is Advisor to the Board and Potential Member. Mr. He is also Vice Chairman of the Board of Trustees of Alfred University. Mr. Lou Reda is a management consultant and advisor to Demodulation.

Dr. Liebermann, a senior principal scientist will act as the Chief Technology Officer of Demodulation. Mr. Michael Bethea, the Executive Vice President - Marketing and Sales operation, is a veteran of security products industry, having come to Demodualtion from the printing industry, where he was responsible for component design, manufacturing and sales. Dr. Ryusuke Hasegawa, a director of magnetics research, will serve as Executive Vice President – Research & Development. Dr. Vladimir Manov is the Manager of International Development for the organization Prior to joining Demodulation Dr. Manov was the Scientific Director at AMT Ltd. in Israel. Members from Alfred University Glass Research Center will also be part of our development team. Dr. Bill LaCourse is the acting director of the Institute for Glass Science and Engineering as well as the Associate Director of the NSF Center for Glass Research. Other members of the Alfred University research group in Alexis Clare, Ph.D. University of Reading, England, Physics and Dr. Xingwu Wang, Professor of Electrical Engineering, Ph.D. University of Buffalo in Physics in 1987.

This team of experts is among the best in their field and has been selected to bring expertise in the area of amorphous alloy, glass science and electronic engineering.

2.3 The Offerings

Our product is revolutionary in terms of processing and application technology. Unlike conventional materials used in the anti-theft applications. Microwires of amorphous (noncrystalline) metals with thickness of 2-30 micrometers are adhered and/or applied to merchandise and are nearly undetectable. These wires are made to provide signals that are picked up by receivers located at either exits or at cash registers in retail stores. The base technology is termed electromagnetic and relies on a special manufacturing processes to draw an amorphous fiber which is encapsulated with glass in a one step process. Even more significant and remarkable is the ability to encode information on the fibers and to extract this information digitally. These signatures are so unique that they are almost impossible to replicate. The encoding process will revolutionize the retail industry and be applicable for tagging used in the road/air freight industries, personal identification tagging, pallet tagging in manufacturing processes, applications that require a tag for identifying a product, article or person in detail. With a sufficient number of bits, the tag can be interrogated to yield useful information such as what the product is, its date of manufacture, its price, and whether the product, article or person has been properly passed through a check out counter or kiosk. Further, identifying a large number of products via tags can lead to a new type of check out system for the retail industry giving rise to the much hoped for "no-wait check-out".

2.4 Market Strategy

Worldwide conditions for new applications to enhance protection from forgery, fraud, brand abuse, counterfeiting, and theft have never been more favorable. The recent advent of terrorist activities coupled with the increasing demand for anti-theft and security products throughout the world has prompted Demodulation LLC to develop and secure emerging technologies, processes and products that can provide immediate solutions for these market demand. Governments, industry, and consumers are stimulating this demand for quality security solutions. Demodulation will provide many of the solutions to meet this overwhelming global need.

The global cost of counterfeiting, product tampering and retail theft is greater than $600,000MM dollars and is estimated to be growing at 15% per year. Retail theft is has high as $60,000MM dollars each year. In the US and UK alone this accounts for 2% of store turnover and 20% of store profit. As a consequence, Electronic Article Surveillance (EAS) is one of the fastest growing markets in the world and represents one of the highest growth security and product sectors. EAS systems are designed to help retailers increase their sales and profits by reducing shop lifting and increasing open merchandising opportunities.

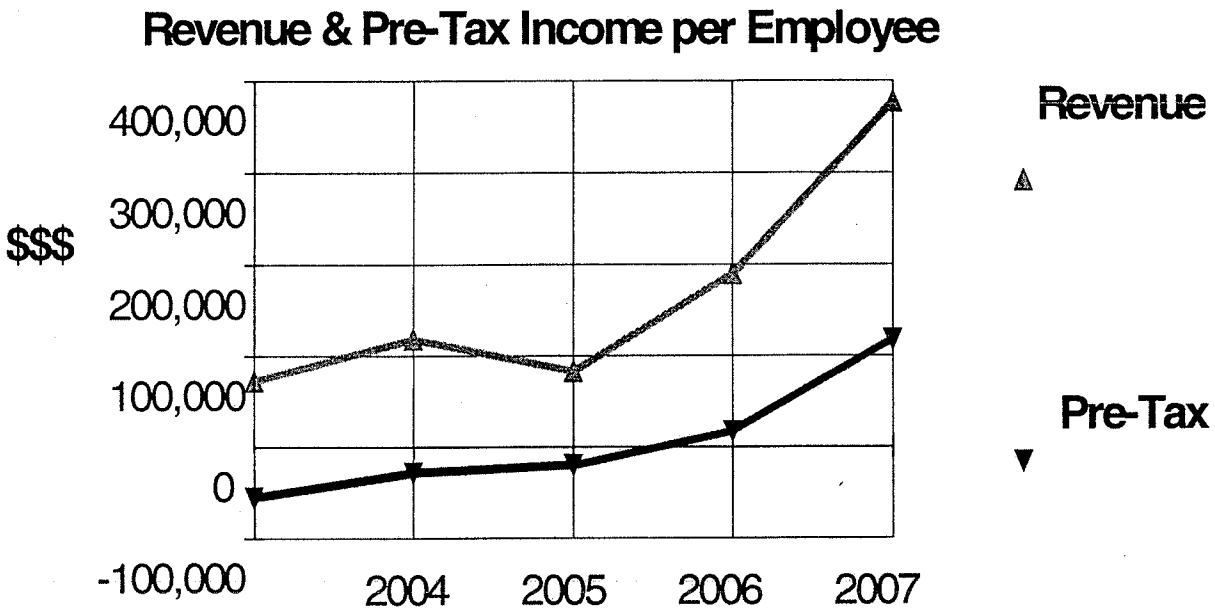
2.5 Milestones

TASK	RESP	START	END
Establish Demodulation		11/01/2001	01/31/2002
Finalize Business Plan		09/01/2001	03/01/2002
Form Management Group		01/01/2002	01/01/2002
Negotiate Acquisition of ACS		03/15/2002	06/01/2002
Set Up Alfred University Research Group		01/22/2002	02/01/2003
Setup northern New Jersey Operations		01/01/2003	02/28/2003
Transfer Equipment to States		12/01/2003	03/01/2004
Set Up Test Beta Sites		06/01/2003	12/31/2002
Establish J/V (Antenna		08/01/2003	ongoing
Finalize New Process		01/15/2004	01/04/2004
Hire Five Regional Sales Managers		01/31/2004	06/01/2004
Initiate Development		06/15/2004	ongoing
Complete Transfer of all operations from Israel		11/01/2003	09/01/2004
Initiate Credit Card Application Development		10/01/2004	04/01/2005
Finalize Contract with Three targeted retailers		04/01/2004	12/01/2004
Hire Additional Engng. Production Personnel		01/15/2005	01/05/2005
Increase Production Capacity		02/01/2005	07/01/2005
Initial development of Paper applications		05/01/2005	01/01/2006
Form J/V with Source Tagging Company		10/01/2005	06/01/2006
Present Encoding Technology to Government		11/01/2005	01/01/2006
Obtain federal Funding "Encoding"		12/31/2005	05/01/2006
Increase Production Capacity		01/15/2006	07/15/2006
File Patents "encoding"		03/01/2006	ongoing
Form Partnership with International Companies		05/01/2006	05/01/2007
Final Expansion		01/15/2007	07/01/2007
Exit Strategy-issues Shares/Sell		03/01/2007	
Totals		09/01/2001	07/01/2007

2.6 Projections

We expect the Microwire business to build a solid growth pattern over the next five years, generating a 16% to 18% PBT. The integration of Israeli facilities and development efforts at Alfred University involve more expense than revenue in the first and second years, but will turn profitable by the third year. Because we expect strong competition from Sensormatic in the second year, we will be pricing Microwire at a low enough price to help achieve significant market penetration and prevent Sensormatic from competing with Demodulation. This will lower overall profit margins in the near term, but should position us well for long term growth and profitability. To achieve the integration of Israel technologies and establish the appropriate development facilities, Demodulation estimates its capital needs at $20 million to authenticate and acquire this technology and to develop appropriate products. This is a very conservative figure that would transition the company in four years to profitability and positive cash flows. Demodulation sales are projected to be $25MM in 2005 and $300 million in 2007.

2.7 Revenue/Income per Employee



3.0 The Enterprise

The objective of Demodualtion is to acquire and develop technology, facilities to manufacture, and to create an organization of highly skilled technologists to provide state-of-the art anti-theft and security products. We intend to be the world's low cost, high quality supplier of such technology with minimum gross margins of 50%. The introduction of these products to market will begin in the year 2003, resulting in growth and in sales of more than $300MM in 2007.

3.1 Objectives

Demodulation expects to become recognized in the industry as a leader in the development and marketing of innovative, high quality anti-theft and security products. Our short-term goal will be to commercialize the technologies developed at ACS in Israel for retail applications and further develop the technology to a level where encoded products can be produced at low costs. To achieve this we will:

- Establish a team of the leading professionals and scientist in the world in glass science, amorphous alloys, electronic materials and security products: Honeywell, Alfred University, Russian Scientist and other personnel
- Acquire ACS development facilities and production processes in Israel.
- Secure license from Romania for Microwire production and/or defend ACS patent applications.
- Form a joint venture with Alfred University the leading University in Glass & Ceramic Technologies and Demodulation.
- Introduce to the market a revolutionary anti-theft product year-end 2003 and achieve sales growth to over $300MM in five years
- Create new proprietary anti counterfeiting encoded products and introduce these to the market in late 2004 for credit card, national ID cards and paper products.
- Become the low cost producer of anti-theft devices by adapting the technology developed by ACS and integrating the research and development capabilities in the US. Achieve a 50% reduction in cost.
- Become the highest quality and most dependable anti-theft system producer in the world by capitalizing on the gating efficiencies of the Microwire and improvements to the antenna systems.

- Integrate Microwire into credit card manufacturing by 4th quarter of 2003 and develop more value-added products in later years that maintain approximately a 50/50 Profit Before Tax (PBT) contribution from component and "assembled" products.
- Introduce a new line of security products for paper by year 2004.
- Introduce new products that are assembled and are valued-added. Increase margins by more than 80%.

3.2 History

Jim O'Keefe, CEO, founded demodulation in January 2002. Dr. Howard Liebermann, Chief Technology Officer, and Michel Bethea, Exec-VP Marketing & Sales were early company members.

Designated shareowners are:

Jim O'Keefe - CEO:
Peter Cuneo: Advisor to the Board and Potential Member
Dr. Howard Liebermann - CTO:
Michel Bethea - EVP Sales & Marketing:
Dr. Ryusuke Hasegawa - EVP - Research & Development:
Lou Reda: Advisor and Management Consultant to Business

The principals founded the company due to increasing market demands for new & improved security components that will reliably function in anti-theft and anti-counterfeiting products. Demodulation will utilize revolutionary amorphous alloy Microwire materials combined with proprietary assembly processes, which will yield low cost solutions. The combination of higher value and lower cost will forever increase market demands in the security industry and position Demodulation as the dominant producer of anti-theft and anti-counterfeiting products. Demodulation has assembled world-renowned scientists to further enhance Microwires and their application into existing market segments and new products. Demodulation is confident that it will be able to capture a significant share of the high growth security market in the next 5 years. Newly created products will open up new market applications resulting in exponential growth in the next five years.

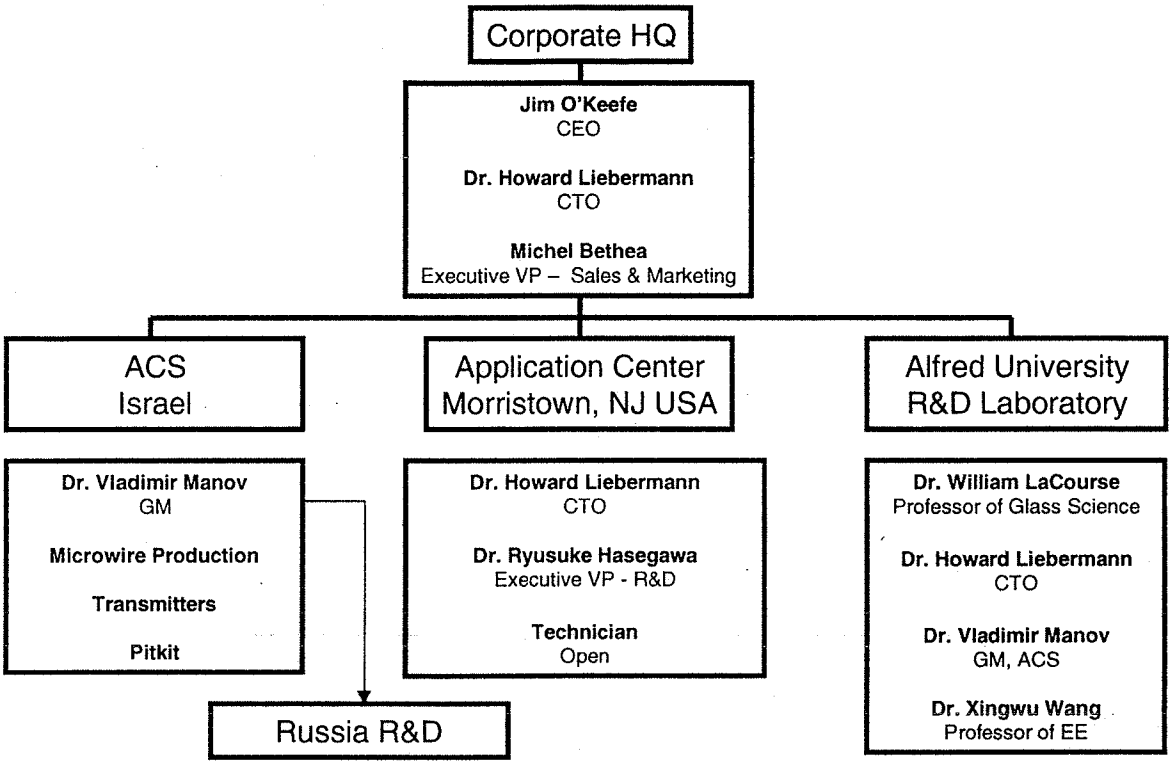
3.3 Organization

Demodualtion will have 22 personnel this year, 75% of who will be involved in the amorphous alloy manufacturing/assembly process. We intend to lease our initial office and manufacturing space 2002/2003 in northern New Jersey and expanded these operations in late 2004. At the same time, maintaining operations in Israel and conducting fundamental research at Alfred University. Initially the Microwire production will be produced in Israel and applications development will be conducted in New Jersey. All process R&D will be performed at Alfred University in order to take a advantage of the Glass Engineering and Science capabilities combined with the state of the art analytical equipment.

The cost of operations at Alfred will be included in the R&D funding. Our lease commitment in NJ will be a two-year lease through December 2004. The majority of our personnel are developmental and management at this time and have roots in the NJ area. We intend to integrate the Israeli work force into the US operations but initially we will use the facilities in Israel as a European center for production and distribution. New process equipment purchases will be primarily done in the US. Specifically, the expansion of assembly equipment for the retail market will be located in specific regional markets after development is complete. Most of these operations are not labor-intensive but are automation equipment driven. It is assumed that a relatively small operation of 50 people providing a 24hr / 7 day a week operation will be able to produce $30MM of sales.

The organization structure as shown below, is quite traditional. Because of the slow growth the first two-year we will be able to be selective about the personnel we have to hire, thus maintaining a very high quality of expertise. The third year of operations will be a period of rapid growth, putting more pressure on us to maintain the quality of personnel.

Organizational Chart



3.3.1 Key Personnel

Jim O'Keefe is Demodulation LLC's founder, president and CEO. He was educated at Alfred University, receiving B.S. in Ceramic Engineering. Mr. O'Keefe's expertise is in the area of business development and marketing of advanced technologies and has extensive international marketing and sales experience.

Mr. O'Keefe has established the following objectives for the coming year:

- Successfully integrate the Research and Development of the US based scientist with the current manufacturing capabilities of the Israeli technology and Russian scientists.
- Upon successful integration, prioritize and manage the successful development of products that will expedite the commercialization of the Microwire anti-theft products.
- Secure the assignment of all intellectual property, patents and inventions of Microwire to Demodulation.
- To ensure the successful development of a patentable product and / or process providing the revolutionary product break-through that ensures industry recognition and market acceptance.
- Secure Development funding contracts with the US Government.

Peter Cuneo is Advisor to the Board and Potential Member, Demodulation, and also chief financial advisor to the company. Mr. Cuneo is also Vice Chairman of the Board of Trustees of Alfred University. He was educated at Alfred University (B.S. Glass Science) and at Harvard University (M.B.A) He is currently the Chief Executive Officer of Marvel Enterprises, Inc (NYSE company) and has significant experience in financially turning around companies.

- Liaison to the financial communities.
- Assist in structuring the company for success.
- Provide guidance and expertise for corporate fund raising.
- Provide recommendations, direction, and guidance on all financial matters of Demodulation.
- Critical liaison with Alfred University.

Dr. Liebermann, a senior principal scientist will act as the Chief Technology Officer of Demodulation. He was educated at the Polytechnic Institute of Brooklyn (B.S. Metallurgical Engineering), and at the University of Pennsylvania (M.S., Ph.D. Metallurgy and Materials Science). Dr. Liebermann is a world-renowned scientist in the area of amorphous alloys and has more than 30 issued patents and over 87 published papers in this field. He is a member of the International Advisory Committee on Rapidly Quenched

Materials and a member of I.E.E.E. Magnetics Society, American Society for Metals, The Metallurgical Society of A.I.M.E., and the Iron and Steel Society

Dr. Liebermann has established the following objectives for the coming year:

- Direct the personnel and integrate the Process, Product and Application Development worldwide for Microwire production.
- Initiate and define research and development guidelines and parameters for anti-theft product development.
- Initiate and define the principal research and development plans for encoding technologies at Alfred University.
- Identify and establish joint research with electronics designers for the advancement of receiver and antenna technology.

Dr. Ryusuke Hasegawa, Executive Vice President - Research and Development. He was educated at Nagoya University (B.S., M.S. Electrical Engineering) and at the California Institute of Technology (Ph.D. Materials Science). Dr. Hasegawa was instrumental in the development of acoustomagnetic anti-theft products (Sensormatic) and holds more than 30 patents in this field.
He is considered one of the foremost experts in the world in this field and brings unparalleled expertise in field of magnetic / anti-theft applications.

Dr. Hasegawa has established the following objectives for the coming year:

- Comprehensive analysis of existing products (Sensormatic / Checkpoint) versus those incorporating Microwire.
- To provide definition for development of electronic receivers and antennas.
- Assist Alfred University in matching amorphous alloy compositions with suitable glass chemistries.
- Provide technical support and design input for encoding of micro-wires at Alfred University.

Michael Bethea, Executive Vice President of Sales and Marketing, is a veteran of security products industry, having come to Demodualtion from the printing industry, where he was responsible for their component design, manufacturing and sales. Mr. Bethea includes in his credentials sales of products to the world trades center site and products sold for security at the world financial summit recently held in New York. Mr. Bethea is a graduate of Rochester Institute of Technology.

Mr. Bethea has established the following objectives for the coming year:

- Identify and secure strategic partners / customers through joint ventures and co-marketing agreement to test market products and prove product effectiveness. Industry segments include paper, credit card, legal documents, ticketing, textile and label manufacturers, etc.

- Introduce the micro-wire product to suitable application with existing manufacturers of secure accreditation services that include the identification of personnel and property, and access control systems.
- Define and initiate commercial development of high-margin value-added products, i.e.: laminated plastics, labels, and fabric products.
- Define Sales and Marketing Plan for facilitating sales growth and market penetration.

Dr. Manov, Executive Vice President - International Development has a Dr. of Science in metallurgy and a Ph.D. in Physical Chemistry from the URL Polytechnic Institute, Sverdlovsk, Russia. Dr. Manov has more than 90 papers published in the field of amorphous metals technology and is a member of the International Advisory Committee on Rapidly Quenched Materials.

Dr. Manov has established the following objectives for the coming year:

- Successful incorporation of applied research and development from Russia/Israel to the US.
- Define performance characteristics in applications of micro-wire in European markets.
- Coordinate basic research in the field of magnetic and electronic interfacing.
- Develop narrow amorphous alloy harmonic production and applications.

Dr. Bill LaCourse, Principle Research Scientist at Alfred University, is the acting director of the Institute for Glass Science and Engineering as well as the Associate Director of the NSF Center for Glass Research. Professor LaCourse received his Ph.D. from Rensselaer Polytechnic Institute in materials Science in1969.

Dr. Bill LaCourse has established the following objectives for the coming year:

- Develop improved glass composition that will enhance Microwire properties and application performance in the field.
- Obtain patents for new glass composition and formulation over amorphous alloy material.
- Manage the high security research and development center for the encoding of Microwire.
- Coordinate and assist in development and implementation of high security government research contracts.
- Manage other members of the Alfred University research group who include Alexis Clare, Ph.D. University of Reading, England, Physics and Dr. Xingwu Wang, professor of Electrical Engineering, Ph.D. University of Buffalo in Physics in 1987. This team of experts is among the best in their field and has been selected to bring expertise in the area of amorphous alloys, glass science and electronic engineering.

JAMES E. O'KEEFE, JR.

121 Goodwin Terrace
Westwood, NJ 07675

(201) 666-0443(H)
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INTERNATIONAL SALES/ MARKETING EXECUTIVE

With Extensive experience in Administration Operations/ Engineering Planning/ Negotiations/Distribution/ International /Strategies

PRODUCTS

* Automotive/appliance/military/connector/computer/aerospace/telecommunication Electronic Shielding and engineered material products
* Powdered metal products/Refractory metal products
* Electronic Substrates/leadframes, selectively plated/thermal management products
* Advanced Ceramic powders/Composites/Structural Materials
* Component electronic thin/thick film metalizations/ hybrid packages and advanced chip packages

SALES/MARKETING ACCOMPLISHMENTS

* Hired and developed new sales representative organizations in the U.S.; managed all customer service department activities; promoted growth by generating key accounts with fortune 500 companies.
* Generated an 8 million piece order valued at $1.7million and forecasted to grow to 20 million pieces and $4 million.
* Designed, developed and marketed component products to AT&T, Delco Electronics, McDonnell Douglas, Magnavox and Honeywell. Increased sales revenue by $4.5 million within 2 years.
* Implemented sales/marketing strategy, increased sales 100% in 1 year.
* Implemented and developed sales and marketing operating plans.
* Negotiated contracts and collaborated with companies including; General Motors, Milwaukee Electric Tool, Americold, Ford Motor Company, Ryobi, Moog, General Instruments, Berg, Norhtrop, GE , Intel, Motorola and others.
* Planned and implemented new warehouse distribution network throughout U.S. and Canada, dramatically increasing sales and profits.
* Developed network of sales/marketing distributors for ceramic powders (fused, aluminum magnesium oxides, spinel, mullite and lapping compounds), increasing sales by $2.8 million in 2 years.

INTERNATIONAL MARKETING & SALES

* Introduced new products, business, applications and concepts for international markets resulting in:
  _ increased market share....100%
  _ increased sales $20 million within 3 years: doubled market share in target category
  _ increased gross profit....$12 million....net profit....$9 million

* Developed and implemented sales/marketing strategic technical support programs for advanced materials products in the international market.
* Successfully developed and sold components to appliance manufacturer in China.
* Directed the implementation and development of international sales/marketing strategies focusing on technology and engineered products transfer from Russia.
* Developed opportunity and negotiated for a joint venture manufacturing operation in Ireland, Israel, France, Germany, Russia and Korea.

ENGINEERING _ R&D TECHNOLOGY TRANSFER

* Developed new engine concept with ford motor company with potential to increase business base dramatically, estimated sales of $30 million. Application moved to development and test stages.
* Introduced unique new product applications and developmental manufacturing techniques which were implemented to the market.
* Developed and designed turnkey refractory system for chemical, steel, powder, leading architectural firms, and OEM industries.

NEW BUSINESS DEVELOPMENT

* Developed & sold $20mm assembly program requiring automation systems.
* Sold /marketed new and existing products designs, powder developments for PM refractory metal products in the domestic and international markets.
* Marketed/introduced advanced ceramic powders to North American market.
* Introduced/Sold new thermally efficient electronic hybrid package to GE for Aircraft Engine Controls.
* Identified technologies and established contracts and technology exchange agreements in several
  product lines including carbon fiber, ceramic powders and shapes, electronics, metals and building materials (China, Central America, Korea, Soviet Union).

CAREER SUMMARY

Marketing Director Shielding Products, Metex Corp.	(2001- present
Business Development Manager, Micro Stamping Corporation	(1997-2001)
Sales Manager, Norwalk Powdered Metals	(1995-1997)
Co-Founder _ International Trade, O'KRA International	(1991-1995)
Regional Manager, Amax Corporation	(1989-1991)
Regional Sales Manager, General Ceramics, Inc.	(1986-1989)
Marketing Manager, Dynamit Nobel	(1982-1986)
Sales Engineer, Babcock & Wilcox	(1976-1982)

EDUCATION/PERSONAL

B.S. Ceramic Engineer, Alfred University (1976)
Various Graduate Level Management and Technical Courses
Married _two children

BRIEF PROFILE

F. PETER CUNEO

NY Apt: (212) 684-7737
27 Old Hattertown Road
Office: (212) 576-8520
Redding, Connecticut 06896
Home: (203) 938-0644

1999-Present Marvel Enterprises, Inc. (New York, NY)
- President, Chief Executive Officer
- Member of the Board of Directors

1998-1999 Cortec Group Inc. (New York, New York)
- Managing Director

1997-1998 Cuneo & Co. L.L.C. (Redding, Connecticut)
- Chairman, Director, HoopStart USA
- Director, Factory Mall.Com

1993-1997 Remington Products Company, L.L.C. (Bridgeport, Connecticut)
1996-1997 President, Chief Executive Officer, Member of Board
1993-1996 President, Chief Operating Officer

1990-1993 Black & Decker Corporation (Anaheim, California)
- President, Security Hardware Group

1976-1990 Bristol-Myers Squibb Company (New York)
1988-199 President, Bristol Myers Pharmaceutical Group, Ottawa, Canada
- Board of Directors, Pharmaceutical Manufacturers Assn.
- Chairman of Board, Canadian Infant Formula Assn.

1985-1988 President, Personal Care Division of Clairol
1983-1985 Executive Vice President, Clairol Appliance Division
1981-1983 Senior Vice President-Administration, Clairol Appliance Division
1980-1981 Assistant Corporate Controller
1978-1980 Controller, Products Division
1976-1978 Assistant Controller, Products Division

1973-1976 W. R. Grace & Company (New York)
1975-1976 Director of Financial Planning & Analysis - Baker Taylor Division
1974-1975 Senior Business Analyst - Corporate Staff
1973-1974 Business Analyst - Corporate Staff

1968-1971 U.S. Navy - Lieutenant - U. S. S. Joseph Strauss (DDG-16)

- Decorated for service in Vietnam
- Communications Officer, Damage Control Officer

1967-1968 Owens Corning Fiberglas Company (Barrington, N.J. Plant)

- Quality Control Engineer

EDUCATION

Alfred University - BS 1967 - Glass Science (Ceramic Engineering)
Harvard Graduate School of Business - MBA 1973

- Academic Honors
- President, International Business Club

OTHER

Vice Chairman, Board of Trustees - Alfred University (Alfred, New York)
Board

HOWARD H. LIEBERMANN
11 Cynthia Drive
Succasunna, NJ 07876
Phone: (973) 927-1328 E-mail: hlieber@mindspring.com

SUMMARY

Ph.D. in metallurgy/materials science and engineering with extensive experience in metal casting/solidification, metal forming, and magnetic/physical properties. Proven supervisory and management skills. Excellent verbal and written skills. Excellent interpersonal skills. Significant impact on business through technical leadership, matters dealing with intellectual property, and training. Six Sigma Black Belt trained, strong individual contributor and effective Team Leader or member. Proficiency in reading/writing, speaking German.

WORK EXPERIENCE

Honeywell/AlliedSignal Metglas Solutions/Morristown, Parsippany NJ
1982-2001
World's largest manufacturer of amorphous metal alloys used for electrical power, high frequency electronic and metal joining applications.

Senior Principal Scientist **1998-2001**
Reported to Director of Technology. Served as key member of business management team, advising and leading technically, especially in areas of expertise including metallurgy/materials science, technical problem solving, and performance analysis.

- Developed and lead technical programs critical to the success of business.

  ✓ Low cost magnetic alloy in support of a $13M existing business.
  - Reduced raw materials cost by 50% to enable competitive product pricing.
  - Completed development and manufacturing integration.

  ✓ Organized and lead proposal for $6M funded research project with off-shore corporation, including project planning, process research, and manufacturing scale-up. Business impact was targeted to increase product line offering and to generate technology-licensing revenue.

  ✓ Organized and led proposal for new product development for electronic article surveillance corporation ($10M opportunity) including project planning, process research, and manufacturing scale-up. Business impact was to increase revenue and to generate technology licensing.

Research Associate **1984-1997**

Reported to Manager, Technology. Supervised a staff of five Ph.D. level scientists and 6 technicians in various technical programs.

- Directed technical service efforts, supporting the introduction of our products into the marketplace.
- Worked closely with customers to resolve issues/problems when utilizing materials, thereby increasing productivity and efficiency.
- Worked closely with Plant to implement critical process improvements in order to increase material throughput and quality.

Senior Metallurgist **1982-1984**

Reported to Supervisor, Process Technology.

- Developed several new production process enhancements, which have since been patented and are incorporated in our production process to this day.
- Developed new and replacement alloys either having superior performance or having other value to the business.

General Electric Research & Development/Schenectady NY
1977 - 1981

World-renowned center for the research and development of new technologies and for the support of GE businesses.

Staff Metallurgist **1977 - 1981**

Reported to Manager, Amorphous Alloys Program

- Conducted process R&D for the production of rapidly quenched amorphous and microcrystalline alloys.
- Investigated magnetic and physical properties of rapidly quenched alloys.

EDUCATION

Ph.D. Metallurgy and Materials Science, University of Pennsylvania, Philadelphia, PA
M.S. Metallurgy and Materials Science, University of Pennsylvania, Philadelphia, PA
B.S. Metallurgical Engineering, Polytechnic University, Brooklyn, NY

TECHNICAL PUBLICATIONS AND PATENTS

- ✓ Publications (88) mostly concerning rapidly solidified alloy design, casting, and property development.
- ✓ Edited book "Rapidly Solidified Alloys", Marcel-Dekker (1993).
- ✓ Patents (30 issued) most relating to the composition, production, and properties of rapidly solidified alloys.

PROFESSIONAL AFFILIATIONS

I.E.E.E. Magnetics Society, A.S.M., T.M.S.-A.I.M.E., I.S.S.

OTHER

- ✓ Corporate training, including 6-Sigma Black Belt, management, software.
- ✓ Numerous corporate patent and numerous other awards.

PERSONAL

Married, two children

Michel D. Bethea
12 Pudding Stone Lane
Oak Ridge, NJ 07438

Professional Experience:

10/00 to Present
Chief Operating Officer, Director of Sales & Marketing
NexPub, Inc., Tarrytown, NY. A Web-to-Print and e-B2B company.

- Reporting to the CEO and the Board of Directors, Led the development and implementation of the NexPub Corporate Print Center and the evolution to the NexPub Corporate Purchase Center, an ASP based revenue model.
- Created workflows and processes for the creation of customized client sites to provide on-line corporate brand management in the delivery of on-demand business and marking collateral, and the fulfillment of product literature and non-print related products through the NexPub web portal.
- As an officer in a public company, dealt with all aspects of regulatory reporting to the SEC as well as speaking with individual investors on a regular basis. Also involved in a greater extent with the investment bank led investors of a PPM in '00 and a new PPM in '01 including the business plan and financial projections to support such efforts.

6/99 to 10/00
CFO, Sr. Vice President & Director of Sales
Elements, New York City, NY. A leading provider of on-demand marketing solutions.

- Member of the Executive Committee, responsible for all Finance, Sales and Marketing functions
- Successfully negotiated contracts in the Healthcare, Insurance and Financial industries for on-demand four-color variable printing.
- Responsible for the creation, development and implementation of product lines that are focused to industry specific one-to-one relationship marketing. Targeted industries included Insurance (personal lines and H/R applications), Finance (retirement and brokerage), High-end Retail, Pharmaceutical and Automotive. Products include lead management, customer acquisition and retention programs.
- Managed 12 account representatives. Management included the introduction of weekly call reporting, monthly sales reporting, and the first ever-sales forecast identified by client and product. Account base covered Boston through the Mid-Atlantic region.

1/95 to 6/99
Director of Business Development
Thebault DI, a division of the L. P. Thebault Company, Parsippany, NJ.

- Part of the management team responsible for the introduction of digital services to the leading commercial printer on the East Coast. Sales revenue grew from $25k per month in January, '95 to over $1mm in December, '97. Annual Sales from $400k in year 1 to $6.5mm in year 4.
- Project manager for variable imaging business unit. Including the development of workflows, negotiating equipment contracts, and the development of staffing requirements including training plans.
- Responsible for all estimating and pricing for both digital offset and dry-toner electro-photographic products, including pre-press and finishing. Involved with all account managers in developing and maintaining customer relationships.
- From 1/95 to 8/96 was the Business Manager responsible for all Financial and Budget reporting as well as Manager of all manufacturing including production, pre-press, press and finishing.

1993 - 1994
Regional Business Manager
Millet Group, Inc., East Rutherford, NJ. A professional consulting firm specializing in the Graphic Communication Industry.

- Responsible for the Northeastern United States and Canadian territories. Engagements were with companies with a range in size of $1mm to $100mm.
- The largest Client was Scitex, working with their regional and national account representatives to provide a workflow and ROI analysis of proposed equipment solutions.

1991 - 1993

Sr. Financial Analyst

L. P. Thebault Company, Parsippany, NJ. A top 100 graphic communication company with services including pre-press, press, and finishing capabilities.

- Developed a new estimating system to incorporate direct rates within an overall MIS conversion. Incorporated new rates with the Marketing department to develop a change in pricing methodology for the sales force.
- Responsible for 1993 & 1992 budgets. Included designing a flex budget tied to general ledger, meeting with senior level management in development, and monthly reviews with manufacturing and administration directors for budget reviews.

- Preparation of monthly financial package including Balance Sheet, P & L, Cash Flow, supporting schedules, and manufacturing performance.
- Preparation, design, and analysis of financial models for multi-million dollar expansion of plant, equipment, and personnel.
- Developed a multi-million dollar consignment inventory with major vendors.

FORMAL EDUCATION

1987 - 1990
Rochester Institute of Technology, Rochester, NY. Bachelor of Science Accounting. President of RIT VITA program. Curriculum encompassed courses in all aspects of accounting along with finance, management, operations, marketing, statistics, and computer information systems.

Personal Notes

Wife Susan, son Andrew (4) and daughter Julia (2).

RYUSUKE HASEGAWA

HONEYWELL

440 Allied Drive, Conway, SC 29526
(Phone: 843-349-7321 / 973-993-1575; e-mail:
ryusuke.hasegawa@honeywell.com)

29 Hill Street, Morristown, NJ 07960 (Home: 973-292-2440)

Nationality: US
Born: Nagoya, Japan
Date of Birth: 07 February 1940

I. Education:

Ph.D.	(Materials Sci.)	California Institute of Technology	1969
M.S.	(Electrical Eng.)	California Institute of Technology	1968
M. Eng	(Electrical Eng.)	Nagoya University (Japan)	1964
B. Eng.	(Electrical Sci.)	Nagoya University (Japan)	1962

II. Work Experience:

1975-Present Honeywell International Inc (Amorphous Metals Business)
Director, Technology (1997-present); Director, Magnetics Research (1992-97); Director, Far East Operation (1989-92); Vice-President, Nippon Amorphous Metals (1985-89); Sr. Research Associate/Res. Associate/Group Leader/Sr. Staff Physicist (1975-85)

1973-75 IBM Thomas J. Watson Research Center (Yorktown Hts, NY)
Post Doctoral Fellow

1965-72 California Institute of Technology (Pasadena, CA)
Research Fellow (1969-72); Graduate Research/Teaching Assistant (1965-69)

III. Professional Activities:

-Member, American Physical Society; Materials Research Society
-Fellow, Institute of Electronics and Electrical Engineers (IEEE)
-Chairperson, IEEE Magnetics Society Technical Committee on Soft Magnetic
Materials (1982-present); Subcommittee Chairperson, IEEE Electronics Transformers Technical Committee (1998-present); IEEE Magnetics Society
Distinguished Lecturer (1990-91)
-Advisory Committee Member for European Soft Magnetic Materials Conference
(1998-present)
-Board Member, Nippon Amorphous Metals Co., Ltd (1983-present)
-Adjunct Professor of Materials Science, Univ. of Tokyo (1988-89)
-Member of Advisory Panel on International Collaboration in Defense Technology, Office of Technology Assessment, Congress of the U.S. (1989-91)
-Served on IEEE Magnetics Society Administrative Committee and Program/Publication/Advisory Committees of Annual Conference on Magnetism
and Magnetic Materials
-Member of Panel on Amorphous Metals, Council on Materials Science, U.S.
Dept of Energy (1980)
-Co-chairperson, 2nd Int'l Conference on Amorphous Magnetism (1976)

IV. Honors and Awards:

Fulbright Scholar (1964-69); Ford Foundation Summer Research Fellowship (1967); RCA David Sarnoff Scholarship and Fellowship (1961, 1964-65); AlliedSignal 10th, 15th and 25th Patent Awards (1985, 1990 and 1998)

V. Invited Technical Presentations:

-Annual Conference on Magnetism and Magnetic Materials (Publ. 41 and 65)
-Int'l Conf. on Amorphous Magnetism (Publ. 20)
-Int'l Conf. on Rapidly Quenched Metals (Publ. 82)
-Int'l Conf. on Liquid and Amorphous Metals (Publ. 92)
-European Soft Magnetic Materials Conference (Publ. 95 and 131)
-CHEMRAWN VI Conf. (Publ. 116)
-Werkstoffe für die Bedürfnisse von morgen (Publ. 122)
-Nishiyama Memorial Lecture Symposium (Publ. 125)
-Int'l Conf. on Advanced Materials and Processing (Publ. 126)
-Intertech Conf. on Soft Magnetic Materials (Publ. 128, 130 and 132)
-Recent Research on Novel Magnetic Structures and their Applications (Pub. 133)
-Int'l Workshop on Magnetic Wire (Publ. 137)
-Seminars in the electrical engineering, physics and materials science depts at
Carnegie Mellon, Univ. Minnesota, Univ. Penn, Harvard, Columbia, MIT, RPI,
Simon Fraser, Univ. British Columbia, McGill, Univ. Basel, Max Planck Inst.,
Tohoku Univ., and Kyoto Univ.

VLADIMIR MANOV, Ph.D., D.Sc. (IV)

CURRICULUM VITAE

Personal

Born:	March 28, 1952, Russia
Marital status:	Married+2
Address:	13 Jores Street, Haifa, Israel
Telephone:	04-8314831 (home)
Mobile:	972-54-899-916

Education

1989 Dr. Sc. Metallurgy, Ural Polytechnic Institute, Sverdlovsk, Russia

1978 Ph.D. Physical Chemistry, Ural Polytechnic Institute, Sverdlovsk, Russia

1974 Masters Degree Physical Chemistry of Metallurgical Processes, Ural Polytechnic Inst. Sverdlovsk, Russia

Working Experience

1993-2001 Scientific Director, AMT Ltd. - Advanced Metal Technologies, Israel.

Development of Technical Programs for New Applications of Amorphous and Nano-Crystalline Metallic Alloys.
Development of Technology, Composition and Methods of Special Treatment of Amorphous Ribbons used for Electrical Heating Elements.
Development of New Low Cost Magnetic Alloys with reduced watt losses for Air-Gap Chokes and C-cores.
Improvement of the quality of Amorphous Ribbon by using the "Special Thermal Treatment" of metallic melt.
Development of Flame Spray Technology for production of Amorphous metallic coatings with thickness up to 0.5mm and their Applications.
Theoretical principles of production of Glass-Coated Microwires.
Influence of temperature, surface tension and viscosity of melts and glasses on the properties of glass-coated amorphous alloys.
Structure and magnetic properties.
Development of continuous technology of glass coated microwires production with diameter from 5 up to 250 μm.
Development of the group of new glass coated amorphous alloys with special mechanical, magnetic properties and range of applications.
Development of new amorphous alloys in the form of narrow ribbon and glass-coated Microwires for EAS applications.

1991-1993 Researcher, Department of Materials Engineering, Technion-Israel Institute of Technology, Haifa
Structure, properties, technology of preparation of Al-base amorphous ribbons.

1989-1991 Head, Department of Liquid and Amorphous Metals, Ural Polytechnic Institute, Sverdlovsk, Russia

Since 1991 Professor of Metallurgy, Ural Polytechnic Institute, Sverdlovsk, Russia

The development of theoretical criteria of glass forming ability of metallic and non-metallic melts.
Investigation of slag-liquid melts interaction under preparation of rapid solidified alloys. Development of technological principles of using the slags under "Rapid Quenching Process".
Development of influence of melt preparation method on the structure and properties of amorphous ribbons.

1974-1989 Junior, Senior Researcher, Lecturer, Faculty of Metallurgy, Department of Glass and Ceramics, Ural Polytechnic Institute, Sverdlovsk.
Structure of Liquid Metallic Alloys. Methods of electron and X-ray diffraction.
Development of Models of Structure of Pure and Binary eutectics alloys.
Development of new amorphous alloys and technology of production.
Development of industrial amorphous alloy technology for Russian Enterprises.

Languages

Hebrew, English, Russian

Teaching Experience.

Lecture courses. Theory of Metallurgical Processes.
Physical Chemistry of Metallic Melts.
Structure and properties Metallic Melts and Amorphous Alloys.
Structure, properties and Formation of Non-Ordered Materials.
(Invited Lecturer in Technion 1997-2000.)

Publications

97 papers in refereed scientific literature

Membership

Member of International Advisory Committee on Rapid Quenching Materials

Dr. William LaCourse
Professor of Glass Science
Director of the Institute for Glass Science and Engineering
Associate Director of NSF Center for Glass Research

Phone: 607.871.2466
Fax: 607.871.2392 flacourse@alfred.edu

Education:

B.S., SUNY at Stony Brook, engineering science (1966)
M.S., SUNY at Stony Brook, materials science (1967)
Ph.D., Rensselaer Polytechnic Institute, materials science (1969)

Principal Research Interests:

Sol-gel processing of glasses and ceramics
Chalcogenide glass fibers
Mechanical properties of glasses
Surface modification techniques
Glass fiber-composition development
Mixed alkali effect
Glass defects and durability

Current Research Projects:

Accelerated ion-exchange strengthening of float glass
Bio-active and bioresorbable materials
Chalcogenide and fiber optic materials
Defects in glazes
Scratch resistance of glasses and coatings

Professional Activities:

Member, American Ceramic Society
National Institute of Ceramic Engineers
Ceramic Educational Council
Ceramic Association of New York
Society of Glass Technology

Honors and Awards:

Fellow, American Ceramic Society
Listed, Who's Who in Frontiers of Science and Technology
Member, Keramos, Phi Kappa Phi
Research fellow, National Research Council (1970)
Recipient, State University of New York Chancellor's Award for Excellence in Teaching
Recipient, Kruson Faculty Award, Alfred University; Alfred University Excellence in Teaching Award

Dr. Alexis Clare

Professor of Glass Science
Director, Industry/University Center for Bioceramics

Dr. Clare's Graduate Students

Phone: 607.871.2368
Fax: 607.871.2392
clare@alfred.edu

Education:

B.S., University of Reading, England, chemical physics (materials and molecules) (1981)
Ph.D., University of Reading, England, physics (1986)

Principal Research Interests:

Structure/optical property relationships in glasses
Biological applications of glasses
Optically active glasses, including lasers, sensors and nonlinear effects
Structure of glasses by neutron and x-ray diffraction

Current Research Projects:

Structure-optical property relations
Structure and relaxation of infrared transmitting material
Glasses for fiber optics for laser surgery
Interactions of glass surfaces with animal cells
Density and wetting behavior of glasses on substrates
Glass ceramics for hysteresis treatment of tumors

Honors and Awards:

John F. McMahon Excellence in Teaching Award, NYS College of Ceramics at Alfred University, (1991, 1993)
Fellow, Society of Glass Technology (1994)
Krusen Award for Excellence in Teaching, Alfred University (1996)
SUNY Chancellor's Award for Excellence in Teaching (1996)

Dr. Xingwu Wang
Professor of EE
Electrical Engineering
218 New Eng. Lab, Seidlin Annex
Alfred University
Phone: 607 871 2130, 607 871 2548
Fax: 607 871 2348
Email:

Education
Ph.D. Physics, SUNY Buffalo, 1987
M.S., Physics, Hangzhou University, 1982
B.S., EE, Harbin Naval Engineering Institute, 1978

Positions
1997-now Professor of EE, Alfred University
1993-1997 Associate Professor of EE, Alfred University
1988-1993 Assistant Professor of EE, Alfred University
1997-1998 Corning Inc., Research Associate - Physics
1995 (part time), 1994, 1993 summer, 1992 summer U.S. Air Force Wright Lab, Visiting Faculty
1993 summer, 1992 summer DOE Argonne National Lab, Summer Faculty
1994 Spring Florida State University, Visiting Associate Professor
1987-1988 Postdoctoral Research Associate, NYSIS, SUNY Buffalo

Research

Publications
19 U.S. Patents, 70 papers

Research Areas
1. Fuel Cells and Fuel Processors
2. Thin film coatings
   Sputtering, RF Plasma, Laser, APCVD, e-beam
3. Superconductors
4. Electrical Power and Instrumentation

Research Grants
2000-2002 EPA/CEER - Fuel Cell and Fuel Processor $ 256K
1990-2000 Industrial sponsors - Thin film, power, system $80K
1993-1996 U.S. Air Force - Superconductors, fuel cells, heat pumps, power $310K
1988-2001 CACT - Thin films, superconductors $258K
1994-1996 NSF - Thin films $49K
1991-1997 NSF CGR - Coating on glass $153
1992-1994 DOE Argonne National Lab - Superconductors, fuel cells, thin films $50K
1989-1990 NYSIS - Superconductors $20K

Teaching
1. Lasers
2. Fiber Optical Communication
3. Applied Electromagnetism
4. Plasma Engineering
5. Communication Systems
6. Electrical Circuits

Research Lab and Research Group
1. Fuel Cell Lab and Thin Film Coating Lab
2. 4 Graduate students (1 technician), and 4 Undergraduate students

3.3.2 Personnel Count

	2003	2004	2005	2006	2007
Engineering/Development					
Management	2	2	6	10	15
Non-management	8	8	24	30	90
Production/Service Delivery					
Management	1	1	4	7	21
Non-management	4	5	25	75	150
Marketing					
Management	1	2	6	18	40
Non-management	0	1	3	9	20
Sales					
Management	1	5	15	45	90
Non-management	0	6	18	40	80
Customer Support					
Management	1	3	9	12	36
Non-management	1	2	6	18	54
General & Administrative					
Management	2	2	6	18	30
Non-management	1	3	9	27	50
Other					
Management	0	0	3	10	20
Non-management	0	2	10	50	100
Total Personnel	**22**	**42**	**144**	**369**	**796**

3.4 Operations

Demodulation although established in 2002 is a start-up company. The company has no assets, however, has been structured to facilitate the integration of recently developed technologies in Israel and Russia for anti-theft applications. This organization provides the intellectual and technological resources required to commercialize this Microwire technology.

The targeted acquisition is based in Israel, and has process capabilities and product applications currently being marketed in Europe. Additionally, this organization has developed electronic reading capabilities that we believe, when incorporated with Demodulation's technology enhancements will provide instant marketability of the refined Microwire products into commercial applications.

The assets include production Microwire equipment capable of manufacturing 10-micrometer diameter wire at speeds of about 1meter per second. The machine capable of delivering this throughput is valued at $100M US and there are 4units available. Additionally, through a joint venture with Pitkit (Israel) an automated assembly process has been developed to manufacture harmonic anti-theft labels at high speed. This automated assembly machine is capable of running 10 strands of Microwire simultaneously and producing 5 continuous strands of anti-theft devices, which operates at 25 ft. per sec. Each individual strand is cut into an anti-theft label. The value of this equipment is estimated to be $250M US.

The ASC Company that is targeted for acquisition was established in 1999 and its goal was to develop product to the security market with materials based on amorphous alloy technologies. In the world today techniques for manufacturing tags for anti-theft are well known in conventional label (i.e. magnetic marker) manufacture. Suitable magnetic materials are also well known and widely available, having high permeability. The coercivity of the magnetic material will depend on the tag's intended use. The magnetic material (amorphous) is preferably in the form of a long thin strip or of a film; these forms avoid major demagnetization effects due to geometric aspect ratio of the magnetic element. Suitable strip materials are available from commercial suppliers such as Vacuumschmelze (Germany), AlliedSignal (Honeywell), and Unitika (Japan). IST (Belgium) is currently manufacturing a thin film material for use in a specific application. None of the manufacturers currently make anti-theft devices and none of the anti-theft producers make amorphous alloys. This creates limitations in the development cycle and limits costs reduction.

ACS produces its own master alloys, has a process to make wire, produces detectors and has a joint venture with Pitkit to perform embedding of fiber into labels. The wire produced using the process has high or medium saturation induction, positive, negative or nearly zero magnetostriction. Furthermore, coercive field and magnetic permeability are consistent with the requirements of various applications. ACS has issued PCT patents:

WO 0120568: GLASS-COATED AMORPHOUS MAGNETIC MICROWIRE MARKER FOR ARTICLE SURVEILLANCE

Abstract: A magnetic marker for use in an article surveillance system, and an electronic article surveillance system utilizing the same are presented. The marker comprises a magnetic element formed by at least one Microwire piece made of amorphous metal-containing material coated with glass. The Microwire piece has substantially zero magnetostriction, coercivity substantially less than 10 A/m, and permeability substantially higher than 20000.

WO 0129755: A Security System for Protecting Various Items and a Method for Reading a Code Pattern

Abstract: A reading head is presented for use in a security system for reading an intermittent code pattern (16), when the code pattern is displaced in a reading direction with respect to the reading head. The code pattern is formed of a plurality of spaced-apart magnetic elements made. The reading head comprises a magnetic means (22, 24) producing a high-gradient static magnetic field, and a sensing element of a kind responsive to signals produced by the magnetic elements. The magnetic means is designed such that it defines and extended narrow region (20) where the static magnetic field vector is substantially equal to zero. The sensing element is located substantially within the zero-field region, and is thereby responsive to signals generated by each of the magnetic elements, when the magnetic element is located in the zero-field region.

Full copies of these patents appear in the Appendix

3.5 The Future

Our organization structure and facilities will be evolving this year. Next year we anticipate a capital expenditure to expand our research at Alfred University and to facilitate introduction of new products. The primary growth will come from enhanced products for retail applications. We anticipate improvements in the signal generation and antenna design and, combined with improvements in the glass composition will result in a new generation harmonic anti-theft tags. These developments will require expenditures in new equipment to support the sales and supply of products. Additional new products will be completed, developed and introduced to the market as shown below:

	Year				
Product	**2003**	**2004**	**2005**	**2006**	**2007**
Electronic Article Surveillance (EAS)					
Retail Applications					
➢ Microwire development	Oct				
➢ Tag assembly/configuration		Oct			
➢ Antenna/gate system	Oct				
➢ Garments		Feb			
➢ Source Tagging		May			
Security Applications					
ID cards, drivers licenses			Mar		
Ticketing		Sep			
Security papers					
➢ Passports				Nov	
➢ Checks			Nov		
➢ Legal Documents				Nov	
Encoded Applications					
ID cards			Sep		
Driver's license				May	
Ticketing				Jan	
Security papers					
➢ Passports					May
➢ Checks				Nov	
➢ Legal Documents					Sep
Inventory control & management					Jan

These applications represent significant intervals of growth for the company and each phase of product introduction to the market will result in substantial sales. The successful implementation of each marketing phase will require additional capitalization.

4.0 Market

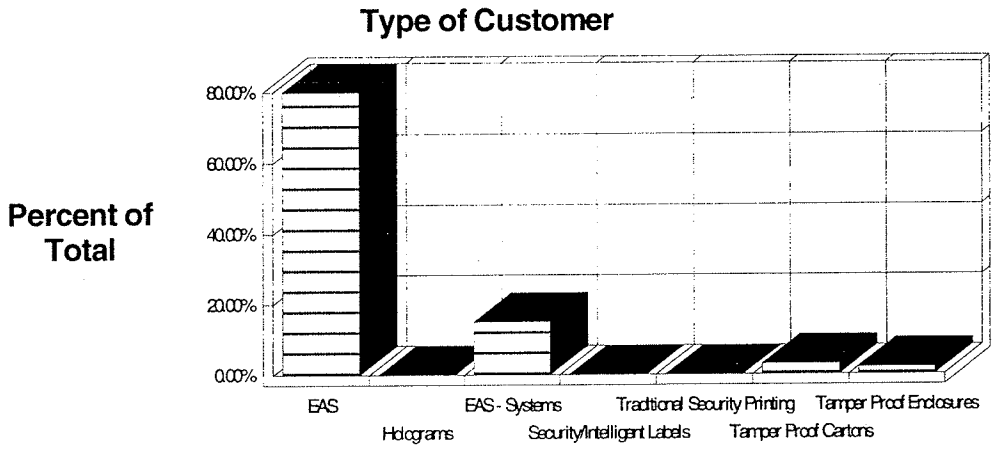
The prospect base for our component products is the multitude of retailers, OEM & label manufacturers worldwide who have tremendous needs for protection theft. We have concentrated our initial efforts in the United States and will be expanding our operations throughout Europe.

Our initial thrust will be to manufacture Microwire for anti-theft applications, to be closely followed by the manufacture of anti-theft tags and interrogation systems. Our initial marketing efforts will be directed at both the retail and source tagging markets. We intend to simultaneously develop novel security card systems. This will be followed by the introduction of advanced encoding products and systems within 5 years after start-up. The combination of these product innovations and offerings will yield sales approaching $300 MM by the year 2007.

The typical margin base for anti-theft products is estimated to be 50%. The value added to the use of Microwires to applications such as security cards and similar systems is expected to generate significantly higher margins, approaching 100%. Once the Microwire is successfully marketed to the retail industry/anti-theft market, we will concentrate on prospects/customers with applications that can yield even higher margins.

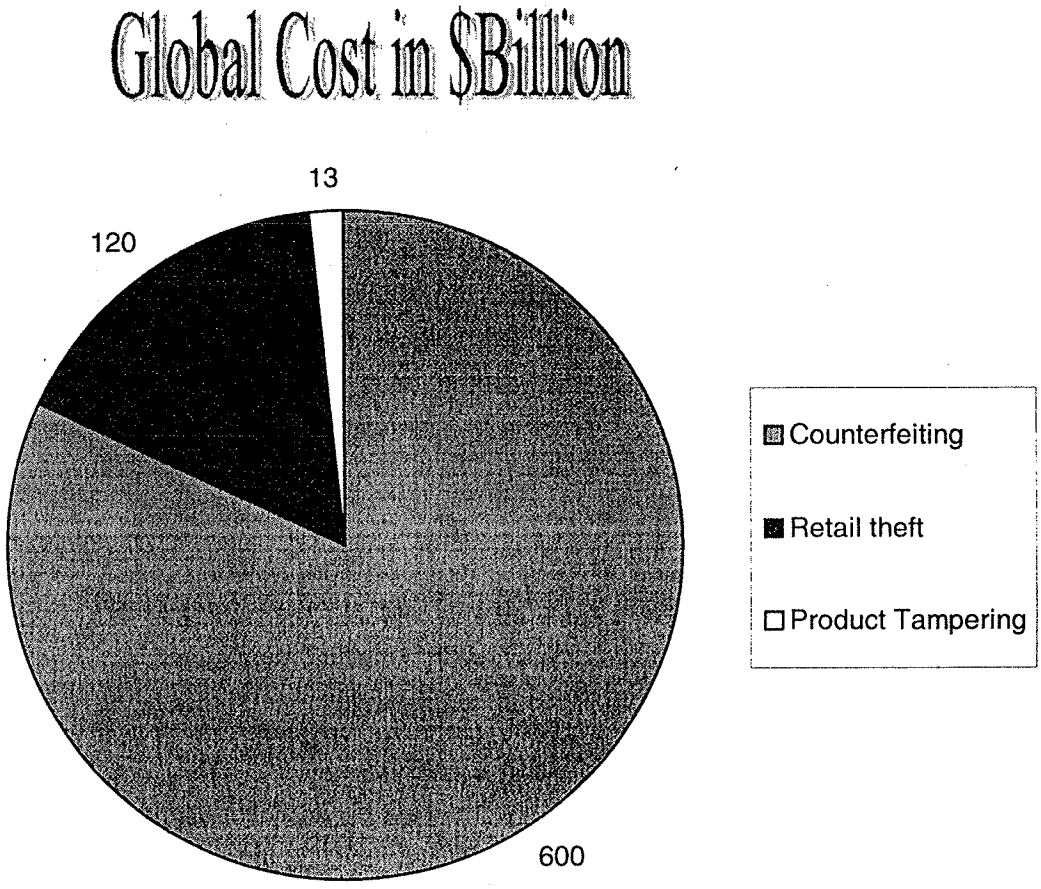
Demodulation's Microwire products have many attributes necessary to cause the potential prospect to purchase it. These products have superior features, advantages, and benefits that provide Demodulation with a unique technological edge in the marketplace. Demodulation will therefore be the premier and preferred supplier in the world of anti-theft/security products.

4.1 Description

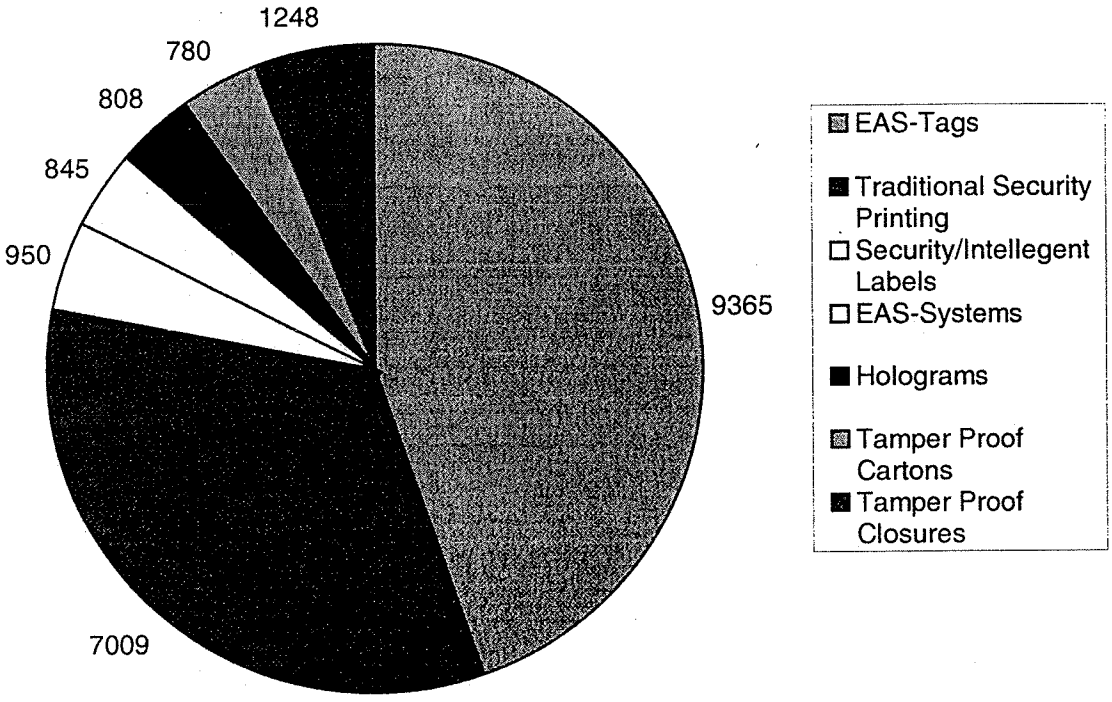


4.2 Objectives

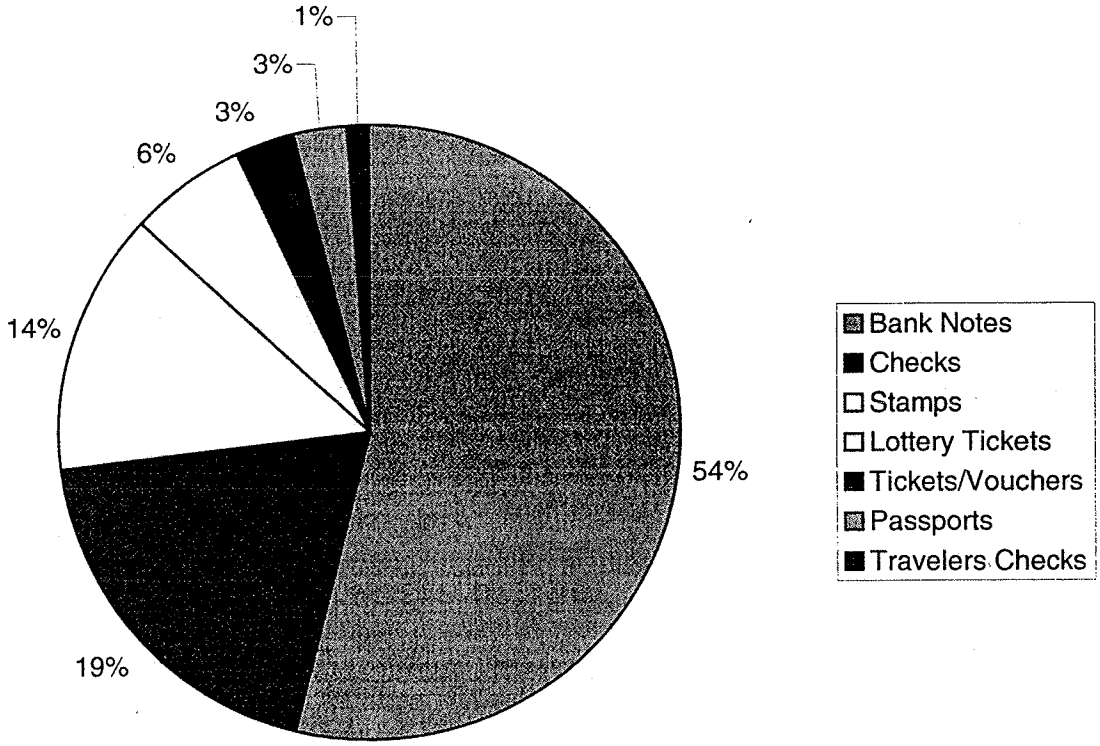
Counterfeiting, Product Tampering & Retail Theft (increasing @ 15% per year)



Product & Imaging Security Solution
Global Demand (units)



Security Papers Market



The prospects for our components are usually retailers, printing and labeling manufacturers, ticketing companies, and manufacturers of security products. The product is generally sold to senior management or purchase agents of these companies. The driving force for the purchase of these products is due to the enormous amount of theft occurring in retail and other operations. It has been estimated that average retail theft in the U.S. and UK alone account for 2% of store turnover and 20% of store profit.

The objectives of purchasers and of senior management are mainly to improve the profitability of their stores by minimizing the incidence of theft. Our products have proven superiority in applications that provide improved performance at lower cost. The uniqueness and flexibility of the product enables it to tailored to fulfill the demanding requirements of a broad variety of applications.

The prospect for Demodulation falls into a variety of diversified categories:

- garment manufacturers
- retail chain stores
- label manufacturers
- packaging companies
- industrial OEM's
- computer manufacturers
- paper manufacturers
- printing companies
- bank and credit card manufacturers
- government (security)
- law enforcement agencies
- currency manufacturers
- casinos
- lottery and other ticket manufacturers
- transportation/transit systems

All the prospects listed above reflect utilization of Microwire that is not encoded. With the addition of encoding technology to Microwire, which we anticipate completing by 2006-2007, ballistic sales growth will occur and our list of prospects will expand to include the following:

- traffic monitoring
- military- various
- grocery self check-out
- inventory control systems
- U.S. mail
- authenticated ticketing
- currency
- express mail/freight
- access control
- credit card manufacturers
- driver's license
- national ID card

4.3 Segmentation

The basic product offering for our company includes Microwire, EAS tags, and anti-theft systems. All of the market segments described in Section 5.2 will utilize at least one of these product forms. The flexibility of the product allows it to be used in a variety of demanding designs. The success of the company's marketing and sales will be greatly dependent on a strong applications engineering group. Dr. Hasegawa will provide the technical expertise and leadership for this group. The company will structure a regionalized sales force that will be managed by Mr. Bethea. The intention of the company is to have industry specialists working in four domestic regions. Our overseas sales and marketing activities will be managed from the United States and are applications engineering driven. However, regionalized sales specialists will be located worldwide. The company expects to form joint venture relationships with strategic printing and label manufacturers in order to capitalize on emerging source tagging market opportunities. These joint venture partners will provide access to packaging and label markets for our Microwire products. Our regional sales engineers will support these customers by providing engineering support to the end users of the labels. Additionally, our sales engineering staff will provide design solutions for the receiver and antenna systems needed to utilize the Microwire products.

Our company will develop distribution centers located at our regional sales support offices to support the retail sales efforts. The primary sales focus in the initial stages of marketing will be to retail, drug, and grocery businesses. We will establish a separate division that will build and install antenna/receiver systems. This group will design and build systems that are concealed at our customers' locations. These systems may be concealed in areas of egress. Our systems will, whenever possible, be designed without the directionality that encumbers present anti-theft systems.

Sales and marketing efforts in other segments will be initiated after successful development of EAS systems. We anticipate the expansion of our sales force by early 2004, at which time successful development of products for the security industry will be complete. Distributors are not intended to be utilized domestically during the first two years of company start-up. The marketing development for new products will be initiated by the technical center in northern New Jersey. Once application acceptance has been proven, additional sales and marketing personnel will be hired to support the growth of these market segments.

Projected sales are given in the table below:

Revenue

Year	Price/part ($/unit)	# of Pieces Sold	Sales (MM$)
2003	0.010	160,000,000	2
2004	0.010	500,000,000	5
2005	0.010	2,500,000,000	25
2006	0.010	7,500,000,000	75
2007	0.010	30,000,000,000	300

Five Year Sales Plan For Anti-theft & Anti-Counterfeiting Applications (NON-ENCODED)

	Sales$(000)				
	2003	2004	2005	2006	2007
EAS SYSTEMS					
Source Tagging	$ -	$ 500	$ 4,000	$ 12,000	$ 38,850
Books	$ -	$ 200	$ 1,100	$ 2,000	$ 8,000
Clothing	$ -	$ 500	$ 2,000	$ 3,000	$ 20,000
Labels	$ 100	$ 500	$ 5,000	$ 10,000	$ 50,000
Retail Stores	$1,500	$2,000	$10,000	$ 42,210	$150,000
SECURITY PAPERS					
Bank Notes	$ -	$ -	$ -	$ 20	$ 100
Checks	$ -	$ 20	$ 250	$ 1,000	$ 5,000
Stamps	$ -	$ -	$ -	$ 10	$ 500
Lottery Tickets	$ -	$ 20	$ 50	$ 250	$ 1,000
Tickets/Vouchers	$ -	$ 500	$ 1,000	$ 1,000	$ 10,000
Passports	$ -	$ -	$ -	$ -	$ 500
Traveler Checks	$ -	$ -	$ 50	$ 10	$ 50
High Security Paper	$ -	$ 250	$ 500	$ 1,000	$ 5,000
Credit Cards	$ -	$ 500	$ 1,000	$ 2,000	$ 10,000
Casino Chips	$ -	$ 10	$ 50	$ 500	$ 1,000
TOTAL	$1,600	5,000	$25,000	$75,000	$300,000

- *Sales are non-encoded products only and are on/off applications!*
- *Sales do not include the leasing and/or sale of electronic receivers or transmitters!*

Projected Sales Plan For Anti-theft & Anti-Counterfeiting Applications (ENCODED) Not included in Sales/Financial Plan

	Sales$(000)				
	2003	2004	2005	2006	2007
EAS SYSTEMS					
Source Tagging	$ -	$ -	$ 25	$ 2,000	$ 50,000
Books	$ -	$ -	$ 25	$ 2,500	$ 8,000
Clothing	$ -	$ -	$ 50	$ 5,000	$ 50,000
Labels	$ -	$ -	$ 50	$ 5,000	$250,000
Retail Stores	$ -	$ -	$ 50	$ 5,000	$250,000
SECURITY PAPERS					
Bank Notes	$ -	$ -	$ 10	$ 1,000	$ 100
Checks	$ -	$ -	$ 10	$ 1,000	$ 5,000
Stamps	$ -	$ -	$ -	$ 10	$ 500
Lottery Tickets	$ -	$ -	$ 10	$ 250	$ 1,000
Tickets/Vouchers	$ -	$ -	$ 10	$ 5,000	$ 10,000
Passports	$ -	$ -	$ -	$ -	$ 500
Traveler Checks	$ -	$ -	$ -	$ 10	$ 50
High Security Paper	$ -	$ -	$ -	$ 1,000	$ 5,000
Credit Cards	$ -	$ -	$ 10	$ 5,000	$ 10,000
Casino Chips	$ -	$ -	$ 10	$ 1,000	$ 5,000
TOTAL	$ -	$ -	$260	$33,770	$645,150

- *Sales are for encoded fibers!*
- *Sales do not include electronic equipment!*
- *Sales may erode some of the non-encoded market after product introduction but by 30%.*
- *Sales imply technology is fully developed in year 2006!*

Note: this chart assumes successful development of encoding technology.

Microwire Product Sales

($MM)

Years

Market Segment	2003	2004	2005	2006	2007
EAS - tags	1.4	4.5	20	100	620
Holograms					
EAS - systems	0.2	0.5	2.0	10	58
Security/IntelligenceLabels			2.0	5	50
Traditional Security Printing			2.0	15	75
Tamper Proof Cartons				7	35
Tamper Proof Enclosures			1.0	10	50
Total	1.6	5.0	27	148	888

Two companies dominate this market, Checkpoint and Sensormatic. It is estimated that the Global EAS market turnover is about $3 billion of which Checkpoint and Sensormatic supply more than 50% of the product. Sensormatic claims that 96 out of the top 100 retailers in the US use their technology. The technology used in EAS systems are broken into three categories – R.F. (Radio Frequency), A.M. (Acoustomagnetic) and E.M. (Electromagnetic). Checkpoint uses R.F technology while Sensormatic uses A.M. technology, both of which are patented technologies. E.M. technology is emerging and is used primarily in Europe, however it is a much more competitively priced technology. Traditional EAS tags produced by Sensormatic Corporation currently sell for $.025 versus $.010 for the E.M. products.

EAS Systems

EAS stands for Electronic Article Surveillance. Becoming more common in the retail industry nowadays, the EAS systems are used to electronically detect goods that have not been authorized when they are removed from a retailer. The systems comprise a tag attached to the goods and a sensor mechanism. The tag can be neutralized by the retailer when he wishes to authorize the removal of the goods, for example when the items have been legitimately purchased. In effect, EAS systems are single bit RFID systems, able to convey their presence, but not having sufficient data capabilities to convey an identity.

Presently there are four major technologies used for EAS systems. They are:

- Microwave
- Magnetic (harmonic)
- Acoustomagnetic
- Radio Frequency

Market penetration is currently estimated at 6,000MM tags per year at $0.04-0.12 each. The different EAS technologies have widely differing performance in the issues of price, reading range and reliability. The Magnetic and radio-frequency versions are very cheap and are generally attached permanently to the goods or their packaging, while the microwave tags are expensive and are removed by the store personnel when the item is paid for using a special removal tool. Markers that are left on the goods and neutralized by the sales staff are called deactivatable.

One type of deactivatable marker is in the form of an electronic circuit comprising inductance and capacitance elements that resonate at radio frequencies. Another type of marker - a magnetic marker - comprises a strip of soft magnetic material that interacts with a ferromagnetic element made of a hard magnetic material that can be magnetized or demagnetized. The soft magnetic strip resonates and generates harmonics in the presence of a magnetic field having a certain frequency. This allows the marker to be identified. The hard ferromagnetic element can be magnetized or demagnetized thereby deactivating or activating the marker.

Another type of marker is the acoustomagnetic or magneto-mechanical marker. This type of marker comprises a strip of magnetostrictive material and a strip of magnetic material of high coercivity. The magnetostrictive material resonates mechanically in the presence of a magnetic field of a particular frequency. A receiver sensitive to the magnetic field created by the mechanical resonating magnetostrictive material can detect this resonance. The marker is ordinarily deactivated by modifying the magnetic bias of the strip of magnetic material.

The above systems are commercially available from many competing suppliers.

EAS is a simple addition to electronic RFID systems whose developments have been announced but are as yet still not commercially available. The advantage of such systems with regard to EAS, is that

- they would broadcast not just the presence of the item triggering the alarm system, but the actual identity of the product
- they would be turned on and turned off by command allowing the same tagging system to have application at all stations from the manufacturer, through the distribution channels, to the retailer
- controlling the tag would not be conspicuous, being incorporated into the reading protocol, rather than the terrible magnetic pads currently used by some retailers that wipes the information from wayward credit cards.
- as the system uses radio communications, the tags can be packaged inside the goods preventing the goods being removed while the boxes with the conventional EAS tags remain behind in the store.
- the EAS features are incorporated in the identification and tracking system for virtually no additional cost.

These systems are still in their infancy and have a long development path ahead.

Multibit EAS Tags

The following article explains some experimental concepts in achieving multibit or multi-status from a modification of standard EAS techniques. Generally EAS tags are single bit devices and are not switchable in both the on and off direction using a programming signal.

A resonant circuit is one in which the values of circuit resistance, R, capacitance, C, and inductance, L, are chosen such that the reactance of the resonant circuit is a minimum at a resonant frequency. One method that is used is for a resonant circuit to be disposed on a thin insulating dielectric substrate to form a tag for use in electronic article detection (EAS) schemes. Generally, the coil of the resonant circuit consists of a closed loop of a conducting element that has a certain value of resistance and inductance. A capacitive element, which forms part of this closed loop, consists of two separate areas of thin metal conducting film disposed on opposite sides of the dielectric. The tag is attached to articles to be protected from theft. An RF signal at or near the resonant frequency of the resonant circuit is emitted from a base station. When the tag is in the RF field, the tag's absorption can lead to a change in the tank circuit current of the base station and a power dip in a receiving coil. Both one of these two effects can be used to sense the presence of the tag and hence the item to which it is attached. Thus, an alarm can be made to sound when either of these effects is sensed by a pickup coil or by an amplifier, indicating improper removal of an item. To deactivate the tag, a relatively high RF power pulse can be applied at the counter at which the point-of-sale of the item takes place. This high power acts to short the capacitor or burn out a weak portion of the coil. In either case, the circuit is no longer resonant and will not respond to the RF interrogation from the base

station. Therefore, the customer who has made a legitimate purchase at the point-of-sale counter can pass through the interrogation-sensing gate without setting off an alarm.

It is clear from this description that these tags, once deactivated, are not reusable. In addition, in the configuration just described, the tags are capable of only conveying one bit of information. Thus, they cannot give any information regarding the item's identification and are useful only for anti-theft applications. This kind of tag is normally classified as a single bit tag.

Some RF tags consist of a resonant coil or a double-sided coil containing two thin film capacitors with the plate of each capacitor on opposite sides of the dielectric. Such tags can be used for source tagging and have an initial frequency that is different from the frequency used at the retail establishment for theft protection. For example the tag is designated as being in a deactivated state until the first capacitor is shorted by means of a high power RF pulse at the then resonant frequency. Disabling the capacitor shifts the resonant frequency of the RF circuit to the store interrogation frequency. A second deactivation pulse is used to disable the second capacitor at the point-of-sale when payment is received for the item to which the tag is attached. At this stage, the tag is no longer usable and has been permanently destroyed.

Some other systems have been proposed where two or more frequencies can be obtained on a RF coil tag by altering the capacitance of the circuit. In one case, a strong DC electric field is applied to change the effective dielectric constant of the capacitor. Thus, the circuit has two resonant frequencies depending on the value of the applied electric field. Due to the ferroelectric hysteresis, the tag can be deactivated by the application of a DC field. However, it can also be reactivated and hence re-used by applying a DC field of opposite polarity.

In another version, a set of capacitors connected in parallel attached to an inductance have been described in which each dielectric of the set of capacitors varies in thickness. In this manner, a series of resonant frequencies can be obtained by applying different voltages (electric fields). Each of the capacitors then changes capacitance at different electric field (voltage) levels depending on the thickness of the dielectric.

Another concept consists of an array of series capacitors connected in parallel with an inductor. Here, the resonance can be altered by selectively shorting one or more of the capacitors, thereby changing the resonant frequency of the resulting circuit. A frequency code can thereby be established by disabling or burning out selective capacitors at the time of interrogation. The tag is not reusable once scanned since the code relies on burning out a capacitor during the scan cycle and observing the change in frequency. Thus, once the tag has been queried its capacitive elements become irreversibly shorted and hence the tag cannot be scanned again.

An idea for a reusable tag comprises of two ferromagnetic elements, one soft (low coercivity) and one hard (high coercivity) both physically covering a portion of an R.F. coil. The ferromagnetic element with high coercivity can be magnetized to apply a bias field to the soft material to put the latter into saturation. In that state, the R.F. field generates very small hysteresis losses leading to a relatively high Q of the tag circuit. On the other hand, when the hard magnet is demagnetized, the RF field results in hysteresis losses in the soft material that lowers the Q of the circuit. This change in Q can be used to determine whether a tag is active or has been deactivated.

A reader apparatus for interrogating and sensing the presence of a RF resonant tag is realized where the interrogating frequency is swept around a center frequency. In general, there is very little radiation emitted except when the tag is present in the field of the emitter. Thus, when there is no tag in the antenna field, very little energy is lost from the antenna circuit. When the swept frequency coincides with the resonant frequency of an active tag, energy is absorbed and a sensing circuit detects a drop in voltage level in the interrogating antenna oscillator circuit. The tag absorption occurs twice with every complete sweep cycle resulting in a negative dip in the oscillator circuit. The negative dip causes pulse modulation that is filtered, demodulated and amplified to cause an alarm to be activated, indicating theft of an item. Thus, the basic detection is achieved by varying the interrogation carrier frequency to match the resonance of a tag whose center frequencies span a range depending on the type or make of tag.

Using Wires for Identification

The following is an extract from US Patent 5729201 invented by Jahnes, Christopher; Gambino, Richard;Paunovic, Milan ;Schrott, Alejandro; and von Gutfeld, Robert where there is a description of prior art that describes the operation of the magnetic based technologies physics which are relevant to many EAS systems

Retail tagging, tagging used in the road/air-freight package industry, personnel identification tagging, pallet tagging in manufacturing processes, etc., requires a tag for identifying a product, article or person in detail. With a sufficient number of bits, the tag can be interrogated to yield useful information such as what the product is, its date of manufacture, its price, whether the product, article or person has been properly passed through a check-out counter or kiosk, etc. Further, identifying a large number of products via tags can lead to a new type of check-out system for the retail industry giving rise to the much hoped for "no-wait check-out".

Conventional tags and tag systems have had a number of problems including: 1) having only one bit, typical of anti-theft tags, or 2) requiring a large amount of power to read the tag, thus requiring a tag battery (or other suitable power source), or 3) being relatively easy to defeat by tampering.

Multibit, remotely sensed tags are needed for retailing, inventory control and many other purposes. For many applications, the cost must be low and the tags must be able to be individually encoded. Further, when the tag is interrogated it

must produce a distinctive signal to reliably identify the article to which the tag is attached or coupled.
Some conventional tags have employed the Barkhausen jump effect. Generally, the Barkhausen effect is characterized by a tendency for magnetization to occur in discrete steps rather than by continuous change, thereby giving rise to a large temporal flux change, $d\phi/dt$, which is key for inducing a sizable voltage in a sensing or pickup coil.

For example, U.S. Pat. No. 5,181,020 describes a thin-film magnetic tag having a magnetic thin film formed on a polymer substrate and a method for producing the same. The thin film exhibits a large Barkhausen discontinuity without intentional application of external torsional or tensile stress on use. A particular disclosed use is as a marker or tag for use in an article surveillance system wherein articles may be identified by interrogating the tagged article in a cyclic magnetic field of a predetermined frequency in a surveillance area and detecting a harmonic wave of the magnetic field generated by the tag in the surveillance area.

This conventional system is only a single bit element using a single Barkhausen layer with no ability to develop a code to distinguish items. U.S. Pat. No. 5,313,192 describes another single bit tag that relies on the Barkhausen effect. The tag of this invention is selected to include a first component comprised of a soft magnetic material that constitutes the bulk of the tag. A second component comprised of a semi-hard or hard magnetic material is integral with the first component. The tag is conditioned such that the second component has activating and deactivating states for placing the tag in active and deactivated states, respectively. Such conditioning includes subjecting the composite tag to predetermined magnetic fields during thermal processing stages.

By switching the second component between its activating and deactivating states the tag can be switched between its active and deactivated states. A reusable tag with desired step changes in flux, which is capable of deactivation, and reactivation is thereby realized.

U.S. Pat. No. 4,980,670 describes a one bit magnetic tag formed from a magnetic material having domains with a pinned wall configuration. The resulting hysteresis characteristic for that material is such that upon subjecting the material to an applied alternating magnetic field, the magnetic flux of the material undergoes a regenerative step change in flux (Barkhausen jump) at a threshold value when the field increases to the threshold value from substantially zero and undergoes a gradual change in flux when the field decreases from the threshold value to substantially zero. For increasing values of applied field below the threshold, there is substantially no change in the magnetic flux of the material. The tag may be deactivated by preventing the domain walls from returning to their pinned condition by, for example, application of a field of sufficiently high frequency and/or amplitude.

U.S. Pat. No. 4,940,966 describes the use of a plurality of magnetic elements in predetermined associations (e.g. with predetermined numbers of magnetic elements and with predetermined spacing between said elements), for identifying or locating preselected categories of articles. When the articles are caused to move relative to a predetermined interrogating magnetic field, each particular association of magnetic elements gives rise to a magnetic signature whereby the article or category of article carrying each of the predetermined associations can be recognized and/or located.

U.S. Pat. No. 4,660,025 describes a marker for use in an electronic surveillance system. The marker, which can be in the form of a wire or strip of magnetic amorphous metal, is characterized by having retained stress and a magnetic hysteresis loop with a large Barkhausen discontinuity. When the marker is exposed to an external magnetic field whose field strength, in the direction opposing the instantaneous magnetic polarization of the marker, exceeds a predetermined threshold value, a regenerative reversal of the magnetic polarization of the marker occurs and results in the generation of a harmonically rich pulse that is readily detected and easily distinguished.

U.S. Pat. No. 5,175,419 describes a method for interrogating an identification tag comprised of a plurality of magnetic, thin wires or thin bands that have highly rectangular hysteresis curves and different coercive forces. The wires or bands are preferably of amorphous material, but means for obtaining the highly rectangular hysteresis curves and different coercive forces are not taught; nor is the concept taught of using a time varying magnetic field superimposed on a ramp field for interrogation. Their invention is an inexpensive multibit magnetic tag is described which uses an array of amorphous wires in conjunction with a magnetic bias field. The use of a ramped field or an ac field or a combination of the two interrogates the tag. The magnetic bias is supplied either by coating each wire with a hard magnetic material, which is magnetized, or by using magnetized hard magnetic wires or foil strips in proximity to the amorphous wires. Each wire switches at a different value of the external interrogation field, due to the differences in the magnetic bias field acting on each wire.

4.4 Size

The Global EAS Market

- EAS systems represent one of the highest growth security systems and product sectors.
- Although they have penetrated over 80% of the US drug chain market there is still enormous potential development among other store types and in other countries.
- The Retail theft amount is believed to be as high as $60,000MM each year.

➢ Average Retail theft in the USA & UK:	2% of store turnover 20 % of store profit
➢ Major Suppliers/producers:	CheckPoint & Sensormatic
➢ Global EAS market turnover:	Greater than $3 billion
➢ Product types in application	R.F. radio frequency (CheckPoint) A.M. acoustomagnetic (Sensormatic) E.M. electromagnetic (ACS)
➢ Market trends:	Source Tagging Hidden EAS Elements

Counterfeiting, Product Tampering & Retail Theft

Global cost has been estimated to be $733 billion in 1998 and is estimated to be increasing at a rate of 15% per year.

Security Papers Market

Global cost for tampering with products and theft has been estimated to is in excess of $1 trillion. This market remains the most significant opportunity for encoded Microwire products. The estimated growth rate of this market is unknown.

4.5 Environment

Worldwide market conditions for new applications to enhance protection from forgery, fraud, brand abuse, and theft have never been more favorable. Governments, industry, and consumers are stimulating this demand for quality security solutions. Demodulation will provide many of the solutions to meet this overwhelming global need. Due to the prevailing world situation, the need for security solutions, such as those provided by our offerings, will only be greater in the future.

A commercial demonstration of the value/workability of a rudimentary offering has been provided by competitors Sensormatic and CheckPoint. The growth of these companies over the past decade or so has been dramatic. The environmental conditions of the marketplace are so strong that even offerings having less than optimal performance have found commercial success. Therefore, with the introduction of innovative products and processes, the market will embrace Demodulation's offerings and thereby create exponential demand.

Most experts generally agree that the United States will adopt a standard national identification card. One of the premier markets for the Microwire technology will be the national ID card. Other markets will include security cards and remote control access products. The encoding of Microwires will be a breakthrough in this application and Demodulation will simultaneously integrate ID card technology with that of Microwires. The replacement of a radio frequency (RF) chip by the Microwire technology will result in savings of up to $2 per card.

The trend towards use of more electronic/electromagnetic devices for use in security applications is a positive influence for the sales of our component products. Also military actions such as those having recently occurred creates a demand for more sophisticated "field" devices that require high performance electrical/electromagnetic components (e.g. security clearance, security documentation, sensors, personal identification).

Demodulation will be introduced to the marketplace as the public, commercial institutions, and government become more sensitized to the need for greater security.

4.6 Alternatives

The main reason Demodulation was formed was that the label and retail industry did not have a good alternative to existing anti-theft products and systems available in the marketplace.

Our offerings are lower cost and have better performance than those currently available. In the long run, this results in a more cost-effective product and a more satisfied customer. Selling the manufacturer on that concept is our major task.

Acceptance and demand for Microwire-based products and technology will be self-perpetuating as potential customers begin to realize its value, as shown below.

Features, Advantages, and Benefits Comparisons

	Demodulation	Sensormatic	CheckPoint	Wallace
Cost	H	L	L	L
Performance				
Gate Width	H	M	H	M
Gating Angle	H	M	H	M
Functional Integrity	H	L	H	L
Tag Size	H	L	L	L
Concealability	H	L	L	L
Ease of Installation	H	L	M	L
Cost of Installation	H	L	M	L
Encoding Capability	H	L	L	L
Ability to Encapsulate	H	L	M	L
Source Tagging	H	L	M	L

Value to Customer: H = high; M = medium; L = low

5.0 Offerings

Benefit to user: Anti-theft

- lower cost of tag($0.01/each vs. $0.025/each)
- improved performance:
  - more reliable
  - more sensitive (improved performance)
- easier installation and lower cost to install in field
- smaller, concealable
- more easily source-tagged
- virtually invisible by human eye
- environmentally more friendly (lower stray fields)
- greater addressable market segment

Comparison to Competition Anti-theft

Microwire technology only recently commercially developed!

Competitors: Sensormatic, CheckPoint

Sensormatic utilizes acoustomagnetic (resonant) technology vs. our electromagnetic (harmonic) technology

- acoustomagnetic relies on principle of mechanical resonance (like tuning fork), which necessitates specialized packaging/assembly methods to enable satisfactory performance
- - electromagnetic relies on very square loop magnetic alloy (very easy magnetization); therefore, there are no constraints on packaging of tag while realizing improved reliability

CheckPoint utilizes RF (radio frequency) technology (high frequency radio waves)

- costly to manufacture
- possibly complications due to operating frequency

Microwire Basic Properties

- Most alloys have a melting point between 800 to 1300°C.
- Core diameter: 2 to 200 micrometers
- Outer diameter: 10 to 220 micrometers
- Alloys and metals produced by AWP today:

  Iron alloys, cobalt alloys, gold, silver, copper and copper alloys.
- Metallic wire diameter range:

  0.002 mm up to 0.150 mm (0.00008 inches up to 0.006 inches)
- Glass coat thickness wall range:

  0.001 mm up to 0.007 mm (0.00004 inches up to 0.00028 inches)
- Overall diameter range:

  0.005 mm up to 0.20 mm (0.0002 inches up to 0.008 inches)

Quality and tolerances:

- Online control of the overall diameter.
- Metallic diameter tolerance +/-1 micrometer on 20 micrometer wire.
- Overall diameter tolerance +/-1 micrometer on 24 micrometer wire.
- Unlimited length of wire on spool.
- Type of spool Hafner HK 76/45.

AWP produces metallic wires from almost any metal or alloy regardless of their brittleness.

Typical tensile strength for Microwire with 15-micrometer diameter core: 20-30 grams.

- Maximum elongation before break: 1.5%
- Coercivity values: 0 to 400 A/m
- Corrosion resistance: Resistant to humidity, seawater, alkali, acids (save hydrofluoric acid), and organic solvents.

- Biological hazards: Similar to those of fiberglass, if not embedded into a substrate.

- Temperature resistance: 150º C long-term, 200º C for one minute.

- Minimum bend radius: 1 mm for a 20/15-micrometer diameter Microwire.

Adherence to Industry Standards

- Industry standards are in process of being developed (good timing for introduction of our product)

- Standards for magnetic field emission met.

Visual Appeal

Virtually invisible (about 10% thickness of human hair)

- undetectable (consumers unaware of it's presence)
- product difficult to detach from retail merchandise
- product able to be directly sewn into garments
- product is dispersed directly into paper during its manufacture (i.e. invisibility)

Ease of Use

- High-speed dispensing/attachment capability (cost savings to customers)
- Small size of product facilitates its utilization in source tagging applications.
- Source tagging is considered to be the trend for future anti-theft applications.
- Source tagging: integrating EAS element directly into packaging, labels, or eventually the merchandise itself. Microwire is ideally suited for such applications. The retailer incurs no costs associated with tag application (tag purchase, inventory, dispensing).

Further applications for Microwire

- Thermostat/temperature controllers
  - Automotive-climate control
  - Aircraft-climate control/diagnostics/shielding
  - Industrial-thermal process control
  - Domestic-climate control/appliances
- Magnetic field sensors
  - Geological Sensors
  - Positioning geographic (Military)
- Torque Sensors
  - Variable speed hand tools
  - ABS
- Structural sensors for strain measurement
- Traction devices
- Superconductors
- Electronic applications
- Planar Magnetics
- PC board and other magnetics applications
- Shielding -EMI
- Woven cloth for area shielding.
- Motor windings and Inductor windings
- Inductive Components
- High Frequency magnetics/computer power supplies
- Ignition systems for sensing the timing of the spark plug
- Military -barrier
- Stealth-radar absorber
- Sensors for medical systems
- Surgical tools
- Avionics
- Inductive components/de-icing
- Safety Shut-off controls
- Industrial Machinery
- Motorized equipment
- Lawn and garden equipment
- Coaxial cable

5.1 Description

The process for making extremely fine wires from the melt was first invented by Taylor (a British scientist) in 1924. He put a drop of molten metal inside a heated glass pipe, and then pulled the softened glass very quickly. The metal was transformed into several micrometer diameter wire coated by glass. In the early fifties, Russian scientists and engineers developed an industrial wire process based on Taylor's idea.

The molten metal drop was heated by strong high frequency electromagnetic field; the same field provided for the drop levitation inside a glass tube, which in turn was softened by hot melt. The thin-walled glass tube filled with solidifying melt was cooled by air or water jet and then was wound on a rotating bobbin. In 1970, Wiesner and Schneider of East Berlin University first obtained such glass coated Microwire with amorphous structure of its metal.

From 1970 till 1992 the technology was widely used in the former USSR. The length of the wire and the diameter uniformity limited the technology. The applications were: resistors, sensors, high voltage transformers, and military applications. No significant progress in the production technology was made during those years. Researchers and engineers of AMT Group (Israel) made the next step in Microwire technology development.

The amorphous glass coated Microwires with outstanding magnetic properties were developed in 1998-2000, and a production facility was built capable of producing large quantities of wire with controllable and highly consistent parameters. One group of wires has excellent magnetic properties at high frequencies and is used in miniature electronic components, and for filtering of electromagnetic interference in printed circuits and cables.

The second group of wires is characterized by a specific magnetic signature and therefore may be used in various security applications. These range from the well-known article surveillance (anti-shoplifting sensors) to the most serious ID and document protection.

The third group of wires is characterized by conducting properties (copper, gold, silver) and therefore may be used in electromagnetic applications such as miniature coils, miniature cables, high voltage transformers and miniature antennas.

The fourth group of wires is characterized by radar absorption and can used for military applications.